

## CLAIMS

What is claimed is:

1. A vehicle passenger detection system for sensing an occupant in a seating area, the system comprising:

a passenger detection system; and

a moisture sensor connected with the passenger detection system;

wherein a measured value of the passenger detection system is altered as a function of a resistance where the function comprises an  $X^Y$  function where Y is a fraction.

2. The system of Claim 1 wherein X comprises the resistance.

3. The system of Claim 1 wherein Y is  $\frac{1}{2}$ .

4. The system of Claim 1 wherein Y is  $\frac{1}{3}$ .

5. The system of Claim 1 wherein the passenger detection system comprises a capacitive sensing system.

6. The system of Claim 1 wherein the moisture sensor comprises two conductors connected by absorbent material.

7. The system of Claim 1 wherein the moisture sensor is positioned in a seat.

8. The system of Claim 1 wherein the passenger detection system operatively connects with an air bag control system.

9. The system of claim 1 wherein the measured value is multiplied by the resistance divided by a constant, the resistance divided by the constant comprising X.

5 10. A vehicle passenger detection method for sensing an occupant in a seating area, the method comprising the acts of:

(a) measuring moisture;

(b) determining a presence of the passenger in the passenger seating area;

10 (c) altering a measured value of (b) as a function of the moisture where the function comprises an  $X^Y$  function where Y is a fraction.

11. The method of Claim 10 wherein (b) comprises determining the presence with a capacitive sensing system.

15 12. The method of Claim 10 wherein (a) comprises measuring a resistance.

13. The method of Claim 10 wherein (a) comprises measuring with a sensor positioned in a seat and wherein a second sensor for (b) is also in the seat.

20 14. The method of Claim 10 further comprising:

(d) controlling an air bag system in response to (b).

25 15. The method of Claim 10 wherein (c) comprises multiplying the measured value by a resistance divided by a constant, the resistance divided by the constant comprising X.

16. The method of Claim 10 wherein  $X^Y$  comprises a square root.

17. The method of Claim 10 wherein  $X^Y$  comprises a cube root.

18. A vehicle passenger detection system for sensing an occupant in a seating area, the system comprising:

an occupant detection sensor; and

a moisture resistant cover adjacent the sensor.

19. The system of Claim 18 wherein the occupant detection sensor comprises an electrode.

20. The system of Claim 18 wherein the occupant detection sensor comprises a plurality of electrodes.

20. The system of Claim 18 wherein the occupant detection sensor comprises a weight sensor in a seat.

21. The system of Claim 18 wherein the moisture resistant cover comprises plastic.

22. The system of Claim 18 wherein the moisture resistant cover substantially encloses the sensor.

23. The system of Claim 18 wherein the moisture resistant cover is positioned over a top of the sensor.

24. The system of Claim 18 wherein the sensor is in a seat and connects with an air bag control system.

25. The system of Claim 18 further comprising a moisture sensor adjacent to the occupant detection sensor.

26. The system of Claim 18 further comprising a soft insulator, the occupant detection sensor connected with the soft insulator, and the moisture resistant cover adjacent the sensor and covering part of the soft insulator.

5 27. The system of Claim 26 wherein the soft insulator comprises at least one aperture adjacent the occupant detection sensor, the at least one aperture positioned at a low point of an upper surface of the soft insulator, low and upper corresponding to a position of the soft insulator in use in a seat.

10 28. A method for protecting a sensor of a vehicle occupant detection system, the method comprising:

(a) covering an occupant detection sensor with a moisture resistant cover; and

(b) positioning the occupant detection sensor in a vehicle seat.

15 29. The method of Claim 28 wherein (a) comprises covering an electrode.

20 30. The method of Claim 28 wherein (a) comprises covering a plurality of electrodes.

31. The method of Claim 28 wherein (a) comprises covering the occupant detection sensor with plastic.

25 32. The method of Claim 28 wherein (a) comprises substantially enclosing the occupant detection sensor with the moisture resistant cover.

30 33. The method of Claim 28 wherein (a) comprises positioning the moisture resistant cover over a top of the occupant detection sensor.

34. The method of Claim 28 further comprising (c) connecting the occupant detection sensor with an air bag control system.

5 35. The method of Claim 28 further comprising (c) positioning a moisture sensor on an opposite side of the moisture resistant cover than the occupant detection sensor.

10 36. The method of Claim 28 further comprising (c) connecting the occupant detection sensor with a soft insulator, wherein the moisture resistant cover is adjacent the sensor and covers part of the soft insulator.

15 37. The method of Claim 36 further comprising (d) forming at least one aperture adjacent the occupant detection sensor, the at least one aperture positioned at a low point of an upper surface of the soft insulator, low and upper corresponding to a position of the soft insulator in use in the vehicle seat.

38. The method of Claim 28 wherein (a) comprises covering a weight sensor.

20 39. A vehicle passenger detection system for sensing an occupant in a seating area, the system comprising:

a vehicle seat insulator;  
a sensor on the vehicle seat insulator;  
a moisture resistant cover over the sensor; and  
25 an air bag controller connected with the sensor.

40. A vehicle passenger detection system for sensing an occupant in a seating area, the system comprising:

a seat cushion;  
30 an occupant detection sensor adjacent the seat cushion; and

at least one aperture in the seat cushion adjacent the occupant detection sensor, the at least one aperture positioned on an upper surface of the seat cushion, upper corresponding to a position of the seat cushion in use in a vehicle seat.

5           41.     The system of Claim 40 wherein the seat cushion comprises a soft insulator.

10           42.     The system of Claim 40 wherein the seat cushion comprises a shaped form, the shaped form having the low point at a back portion of the upper surface and the at least one aperture positioned at the low point.

          43.     The system of Claim 40 wherein the at least one aperture comprises a plurality of apertures.

15           44.     The system of Claim 40 wherein the at least one aperture comprises at least two apertures.

          45.     The system of Claim 40 wherein the occupant detection sensor comprises an electrode.

20           46.     The system of Claim 40 wherein the occupant detection sensor comprises a weight sensor.

25           47.     The system of Claim 40 further comprising a moisture resistant cover over the occupant detection sensor.

          48.     The system of Claim 40 wherein the at least one aperture is through the seat cushion, allowing fluid to drain due to gravity.

49. A method for protecting a vehicle occupant detection system, the method comprising:

(a) positioning an occupant detection sensor adjacent a seat cushion;  
and

(b) forming at least one drain in the seat cushion adjacent the occupant detection sensor, the at least one drain positioned at a low point of the seat cushion, low corresponding to a position of the seat cushion in use in a vehicle seat.

50. The method of Claim 49 further comprising (c) shaping the seat cushion with the low point at a back portion of the upper surface.

51. The method of Claim 49 wherein (b) comprises forming a plurality of apertures through the seat cushion.

52. The method of Claim 49 wherein (a) comprises positioning an electrode on the seat cushion.

53. The method of Claim 49 wherein (a) comprises positioning a weight sensor on the seat cushion.

54. The method of Claim 49 further comprising (c) covering the occupant detection sensor with a moisture resistant cover.

55. A vehicle passenger detection system for sensing an occupant in a seating area, the system comprising:

a vehicle seat having an insulator, the insulator having at least one drain;  
an occupant detection sensor adjacent the insulator; and  
an air bag controller connected with the occupant detection sensor;

wherein the at least one drain is positioned at a low point of an upper surface of the insulator, low and upper corresponding to a position of the insulator in the vehicle seat.